DETAILED ACTION

This Examiner's Amendment and Examiner's Reasons for Allowance action is in response to the filing of 05/15/2009.

EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview and via E-mail with Jeffrey F. Slater on 08/19-24/2009.

- The application has been amended as follows:

1. (Currently Amended) A method in a wireless receiver of decoding M x N symbols in which a first codeword of length N of a first set of K codewords has been spread by a second codeword of length M of a second set of L codewords, the first codeword identifying a first information and the second codeword identifying a second information, the method comprising:

receiving the MxN symbols via an air interface of the wireless receiver;

for each set of M consecutive symbols, performing a first parallel code multiplying operation by multiplying the M symbols by each of the L codewords of the second set of codewords, thereby producing L first output symbols, each of the L first output symbols being associated with one of the L codewords;

for each of at least one codeword of said set of L codewords:

for a set of N consecutive first output symbols associated with the codeword, performing a respective second parallel code multiplying operation by multiplying the set of N consecutive first output symbols by each of the K codewords of the first set of codewords to produce a set of K second output symbols, each second output symbol being associated with one of the K codewords and with said codeword of the set of said L codewords;

determining an overall maximum second output symbol of the second output symbols produced by said second parallel code multiplying operation; and

determining the first information from the codeword of the first set of codewords associated with the overall maximum second output symbol and determining the second information from the codeword of the second set of codewords associated with the overall maximum second output symbol.

2. (Previously Presented) A method according to claim 1 wherein the first set of codewords is a Walsh code, and the second parallel code multiplying operation comprises a FHT (Fast Hadamard Transform).

3. (Previously Presented) A method according to claim 1 wherein the first set of codewords is a truncated Walsh code, the method further comprising padding each set of N consecutive output symbols to a power of 2, wherein the second parallel code multiplying operation comprises a FHT.

4. (Previously Presented) A method according to claim 1 wherein the second set of codewords is a Walsh code, and the first parallel code multiplying operation comprises a FHT.

5. (Previously Presented) A method according to claim 1 wherein the second set of codewords is an orthogonal code.

6. (Previously Presented) A method according to claim 3 wherein the second set of codewords is a Walsh code, and the first parallel code multiplying operation comprises a FHT.

7. (Previously Presented) A method according to claim 6 wherein M=8, N=12, L=8, K=16, the second set of codewords is an 8-Walsh code, and wherein the first set of codewords is a truncated Walsh code in the form of a (12,4) block code which is padded to length 16.

8. (Previously Presented) A method according to claim 2 wherein M=8, N=8, L=8, K=8 the first set of codewords is an 8-Walsh code, and the second set of codewords is an 8-Walsh code.

9. (Original) A method according to claim 1 further comprising:

performing sequence de-repetition prior to said first parallel code multiplying operation.

10. (Cancelled)

11. (Original) A method according to claim 7 **[[**~~further comprising:~~

~~determining the first information from the codeword of the first set of codewords associated with the overall maximum output and determining the second information from the codeword of the second set of codewords associated with the overall maximum output;~~**]]**

wherein the first information comprises a channel quality indication, and wherein the second information comprises a sector identifier.

12. (Currently Amended) A method according to claim 8 **[[**~~further comprising:~~

~~determining the first information from the codeword of the first set of codewords associated with the overall maximum output and determining the second information from the codeword of the second set of codewords associated with the overall maximum output;~~**]]**

wherein the first information comprises a data rate control indication, and wherein the second information comprises a sector identifier.

13. (Original) A method according to claim 1 wherein said second parallel code multiplying operation is performed for at least 2 of the L codewords.

14. (Original) A method according to claim 1 wherein said second parallel code multiplying operation is performed for all of the L codewords.

15. (Original) A method according to claim 1 wherein said at least one codeword are fewer than all of the L codewords, and the at least one codeword is selected by accumulating energy after the first parallel code multiplying operation for each possible codeword after the first parallel code multiplying operation, and selecting the at least one codeword having greatest energy.

16. (Currently Amended) An apparatus for decoding M x N symbols in which a first codeword of length N of a first set of K codewords has been spread by a second codeword of length M of a second set of L codewords, the first codeword identifying a first information and the second codeword identifying a second information, the apparatus comprising:

a wireless receiver configured to receive the MxN symbols wirelessly;

a first parallel code multiplier which, for each set of M consecutive symbols, performs a first parallel code multiplying operation by multiplying the M symbols by each of the L codewords of the second set of codewords, thereby producing L first output symbols, each of the L first output symbols being associated with one of the L codewords;

a second parallel code multiplier which, for each of at least one codeword of said set of L codewords, performs:

for a set of N consecutive first output symbols associated with the codeword, a respective second parallel code multiplying operation by multiplying the set of N consecutive first output symbols by each of the K codewords of the first set of codewords to produce a set of K second output symbols, each second output symbol being associated with one of the K codewords and with said codeword of the set of said L codewords;

wherein an overall maximum second output symbol of the second output symbols produced by said second parallel code multiplying operations is selected, the first information is determined from the codeword of the first set of codewords associated with the overall maximum second output symbol and the second information is determined from the codeword of the second set of codewords associated with the overall maximum second output symbol.

17. (Previously Presented) An apparatus according to claim 16 wherein the first set of codewords is a Walsh code, and the second parallel code multiplying operation comprises a FHT (fast Hadamard transform).

18. (Previously Presented) An apparatus according to claim 16 wherein the first set of codewords is a truncated Walsh code, the apparatus being further adapted to pad each set of N consecutive output symbols to a power of 2, wherein the second parallel code multiplier comprises a FHT.

19. (Previously Presented) An apparatus according to claim 16 wherein the second set of codewords is a Walsh code, and the first parallel code multiplier comprises a FHT.

20. (Previously Presented) An apparatus according to claim 16 wherein the second set of codewords is an orthogonal code.

21. (Previously Presented) An apparatus according to claim 18 wherein the second set of codewords is a Walsh code, and the first parallel code multiplier comprises a FHT.

22. (Previously Presented) An apparatus according to claim 21 wherein M=8, N=12, L=8, K=16, the second set of codewords is an 8-Walsh code, and wherein the first set of codewords is a truncated Walsh code in the form of a (12,4) block code which is padded to length 16.

23. (Previously Presented) An apparatus according to claim 17 wherein M=8, N=8, L=8, K=8 the first set of codewords is an 8-Walsh code, and the second set of codewords is an 8-Walsh code.

24. (Original) An apparatus according to claim 16 further comprising:

a sequence de-repetition function adapted to perform sequence de-repetition prior to said first parallel code multiplier.

25. (Original) An apparatus according to claim 16 wherein the first information comprises a channel quality indication, and wherein the second information comprises a sector identifier.

26. (Original) An apparatus according to claim 16 wherein the first information comprises a data rate control indication, and wherein the second information comprises a sector identifier.

27. (Original) An apparatus according to claim 16 wherein the second parallel code multiplying operation is performed for at least 2 of the L codewords.

28. (Original) An apparatus according to claim 16 wherein the second parallel code multiplying operation is performed for all of the L codewords.

29. (Original) An apparatus according to claim 16 wherein said at least one codeword are fewer than all of the L codewords, and the at least one codeword is selected by accumulating energy for each possible codeword after the first parallel code multiplying operation, and selecting the at least one codeword having greatest energy.

Allowance

2. Claim 10 has been cancelled.

3. Claims 1-9 & 11-28 have been amended with written arguments which overcome the examiner's prior rejections and objections, see paper of 01/21/2009. Examiner withdraws all outstanding rejections and objections to Claims 1-9 & 11-28.

4. Claims 1-9 & 11-28 are allowed.

Examiner's Statement of Reasons for Allowance

5. Prior art was found which disclosed using orthogonal coding in a communication system [e.g. Falconer et al. (US-5204874-A)] and multiple access coding using bent sequences for mobile radio communications [e.g. Bottomley et al. (US-5550809-A)] and generating signal waveforms in a CDMA cellular telephone [e.g. Gilhousen (US-5103459-A)].

6. The following is an examiner's statement of reasons for allowance:

- The prior art of record does not teach or render obvious the limitations as recited in independent Claims 1 &16, specific to: "the first information is determined from the codeword of the first set of codewords associated with the overall maximum second output symbol" and "the second information is determined from the codeword of the second set of codewords associated with the overall maximum second output symbol".
- Dependent claims are allowed as they depend from an allowable independent claim.
- Therefore, the Examiner considers both the above limitations in combination with the remaining limitations "for each set of M consecutive symbols, performing a first parallel code multiplying operation by multiplying the M symbols by each of the L codewords of the second set of codewords, thereby producing L first output symbols, each of the L output first output symbols being associated with one of the L codewords" and "for each of at least one codeword of said set of L codewords: for a set of N consecutive first output symbols associated with the codeword, performing a respective second parallel code multiplying operation by multiplying the set of N consecutive first output symbols by each of the K codewords of the second set of codewords to produce a set of K second output symbols, each second output symbol being associated with one of the K

codewords and with said codeword of the set of said L codewords" and "determining an overall maximum second output symbol of the second output symbols output of said second parallel code multiplying operations" found in each independent claim as applied to decoding CDMA quality channel(s) as the non-obvious novelties of the invention.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance".

Conclusion

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Oscar Louie whose telephone number is 571-270-1684. The examiner can normally be reached Monday through Thursday from 7:30 AM to 4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nasser Moazzami, can be reached at 571-272-4195. The fax phone number for Formal or Official faxes to Technology Center 2400 is 571-273-8300.

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08/25/2009

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